

NOVEL ASYMMETRIC BENZYLIDENECYCLOHEXANONE PHOTOCHROMIC COMPOUND AS FOOD DYE WITH ANTIOXIDANT PROPERTIES

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Abstract

Nature has always been the provider of compounds with unique properties and amazing application within or outside the living organisms [1]. Color is certainly one of the natural features that have always fascinated researchers from almost all fields of knowledge and compounds with such properties have been isolated from raw materials or have been designed and synthesized based thereon [2]. Flavylum derivatives are natural or synthetic compounds responsible for certain color of fruits and flowers and are able to turn from yellow to red and blue depending on the pH of the media [3]. They are also studied for their photochromic behavior when excited with different wavelengths and their network of chemical transformation has been the subject of many research papers [4,5].

We have focused lately on the synthesis of xanthylum derivatives [6], compounds similar in behavior with flavylum ones with symmetrical and asymmetrical substituents on the aromatic rings. The photochromic behavior of the new asymmetric benzylidene cyclohexanone derivative 4-(p-hydroxybenzylidene)-6-hydroxy-1,2,3,4-tetrahydroxanthylum chloride (HTX) in aqueous solution at different pH values was studied using UV-Vis, NMR and fluorescence spectroscopy. In strong acid environment HTX exhibits purple color and a broad absorption band at about 516 nm, corresponding to the presence of the xanthylum cation, while in basic conditions the solutions are red, with an absorption band at about 596 nm. At pH ranging from 9 to 12 HTX is bluish and suffers spontaneous transformations between species involved in the network of chemical reactions. HTX shows good fluorescence behavior at all pH values. HTX has a good antioxidant character of 55.15% determined by DPPH method. The features described above and its curcumin origin would highly recommend it for application in the field of food colorants.

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References

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